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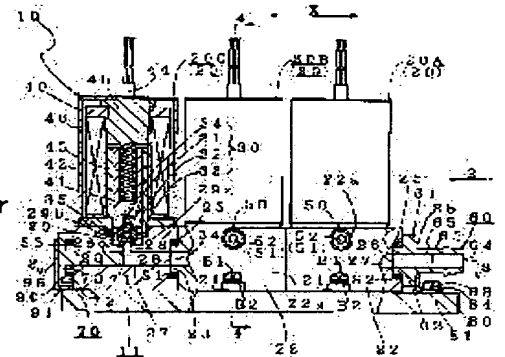
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(54) MANIFOLD VALVE STRUCTURE BODY

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a manifold structure body excellent in a general purpose for use.

SOLUTION: The manifold valve structure body 10 has a base member 11; a mounting fixed part 21; a connection projection part provided at one side; and a connection recessed part 25 provided so as to correspond to the connection projection part. The manifold valve structure body 10 includes a plurality of valve block bodies 20A, 20B, 20C comprising a block body constituted such that a plurality of block bodies are connected to each other to use it; a main flow passage connection member 60 having a connection flow passage 63 connected to a connection recessed part or a connection projection part at one side end of a plurality of valve block bodies to be communicated with a penetration main flow passage 27 of the valve block body, a main flow passage sealing member 70 connected to a connection projection part or a connection recessed part at the other side end of a plurality of valve block bodies to seal the penetration main flow passage; and end side fixing members 80, 90 for fixing the main flow passage connection member and the main flow passage sealing member respectively.



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CLAIMS

[Claim(s)]

[Claim 1] It has a fixed part for attachment (21) to a base member (11) and this base member. In the side connection heights (23) and else, it has a connection crevice (25) corresponding to these connection heights at the 1 side of the body of the bubble body (22). Heights side connection opening which consisted of a constituted block object so that it could be used connecting more than one, and was formed in said connection heights (24), The penetration mainstream way which opens for free passage crevice side connection opening (26) formed in said connection crevice, and said heights side connection opening and crevice side connection opening (27), The branching passage which was open for free passage on this penetration mainstream way, and was formed free [closing motion] through the valve element (30) (28), The valve chest (29) which holds said valve element through this branching passage, and the valve drive which operates said valve element (40), Two or more valve block objects equipped with the subpassage connection (50) which has the subpassage (51) which a subpassage end connection (52) is formed at a tip, and is open for free passage with said valve chest (20A, 20B, 20C), The mainstream way connection member which has the connection passage (63) which is connected with the connection crevice or connection heights in said 1 side edge section of two or more valve block objects, and is opened for free passage with said penetration mainstream way (60), The mainstream way closure member which is connected with the connection heights or the connection crevice in an edge of a side besides said two or more valve block objects, and closes said penetration mainstream way (70), The manifold valve structure object characterized by including the edge side holddown member (80 90) for having the attachment section (81 91) to said base member, and fixing said mainstream way connection member and a mainstream way closure member, respectively (10).

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to a manifold valve structure object.

[0002]

[Description of the Prior Art] In order to mix two or more fluids, such as water and a chemical, by the predetermined flow rate, to supply as a mainstream object (interflow object), or to change suitably two or more sorts of other fluids to the fluid of 1, to mix and to supply, or since the fluid of 1 is distributed and supplied to two or more locations, the manifold valve structure object 100 as shown in drawing 9 and drawing 10 may be used.

[0003] Said manifold valve structure object 100 consists of a main block object 101 and two or more valve block objects 111. While the horizontal penetration mainstream way 102 in alignment with the longitudinal direction is formed in said main block object 101, two or more main block side branching passage 103 which is open for free passage on said penetration mainstream way 102 from the top face of the main block object 101 is formed in the longitudinal direction of the main block object 101 at intervals of predetermined. Moreover, the main connection 104 for connecting with external passage is formed in the end section of said penetration mainstream way 102 as fluid outflow admission into a club. Furthermore, in the main block object 101 concerned, two or more formation of the main block comes passage 105 penetrated on a transverse plane, a tooth back, or a side face from the top face is carried out at intervals of predetermined at the longitudinal direction of said main block object 101. In addition, the subconnection 106 for connecting with external passage is formed in the end section (edge by the side of fields other than a top face) of each of said main block comes passage 105 as fluid outflow admission into a club.

[0004] On the other hand, two or more (the example of illustration three pieces) valve block objects 111 are installed by the top face of said main block object 101. In the lower part of each valve block object 111, while the valve block side branching passage 112 and the valve block comes passage 113 leading to each main block side branching passage 103 of said main block object 101 and each main block comes passage 105 are formed in the vertical direction, the direction of slant, etc. The valve chest 114 which leads to said valve block side branching passage 112 and the valve block comes passage 113 is formed, and the valve element 120 which opens and closes said valve block side branching passage 112 is held in this valve chest 114 possible [an attitude]. Said valve element 120 moves with the proper valve drive 125. In the example of illustration, the valve drive 125 which a well-known diaphragm valve element is used [drive] for said valve element 120, and makes this valve element 120 move uses the electromagnetic-induction operation. In addition, as for the energization section and 130, the spring with which the actuation member which the sign 121 of illustration consists of a movable iron core to which the seal section for closing motion of a valve element 120 and 122 move by the periphery attachment section of a valve element 120, and 126 moves by the electromagnetic induction of the valve drive 125, and is attached in a valve element 120, and 127 energize the actuation member 126 to a coil, and 128 energizes it to the front, and 129 are [a fixed block and 131] cases.

[0005] In the manifold valve structure object 100 of said structure, the feeder which supplies a proper fluid to the subconnection 106 of two or more of said main block comes passage 105 is connected through external passage. And specified quantity supply of the fluid is carried out into the penetration mainstream way 102 by operating a valve element 120 with the valve drive 125 of said valve block object 111 if needed, and opening said valve block side branching passage 112 wide. In addition, what is necessary is for actuation of a valve element 120 to open the valve block side branching passage 112 of the valve block object 111 corresponding to the fluid needed, and just to make it close the valve block side branching

passage 112 of the valve block object 111 corresponding to the fluid which is not needed by the valve element 120, in changing two or more sorts of fluids and supplying in the penetration mainstream way 102. [0006] However, when putting in another way so that it could respond to the number of the fluids to supply (mixing) etc. according to a user's needs if it was in the above-mentioned conventional manifold valve structure object 100, the main block object 101 had to be designed each time, and it was disadvantageous for versatility being not only scarce but in cost so that it might agree in the number of the valve block objects 111 to combine. Moreover, since it will be necessary to newly carry out the design change of the main block object 101, and to exchange it according to the number of the valve block objects 111 to combine when it is necessary to make the number of the fluids to supply fluctuate after the installation, if it is in the manifold valve structure object concerned, it was not economical while taking time and effort.

[0007]

[Problem(s) to be Solved by the Invention] This invention can respond simply and promptly, also when changing the number of the fluids supplied after installation etc., and, moreover, tends to offer the advantageous manifold valve structure object also in cost while it is proposed in view of the aforementioned point and is excellent in versatility.

[0008]

[Means for Solving the Problem] Namely, this invention is equipped with the fixed part for attachment (21) to a base member (11) and this base member. In the side connection heights (23) and else, it has a connection crevice (25) corresponding to these connection heights at the 1 side of the body of the bubble body (22). Heights side connection opening which consisted of a constituted block object so that it could be used connecting more than one, and was formed in said connection heights (24), The penetration mainstream way which opens for free passage crevice side connection opening (26) formed in said connection crevice, and said heights side connection opening and crevice side connection opening (27), The branching passage which was open for free passage on this penetration mainstream way, and was formed free [closing motion] through the valve element (30) (28), The valve chest (29) which holds said valve element through this branching passage, and the valve drive which operates said valve element (40), Two or more valve block objects equipped with the subpassage connection (50) which has the subpassage (51) which a subpassage end connection (52) is formed at a tip, and is open for free passage with said valve chest (20A, 20B, 20C), The mainstream way connection member which has the connection passage (63) which is connected with the connection crevice or connection heights in said 1 side edge section of two or more valve block objects, and is opened for free passage with said penetration mainstream way (60), The mainstream way closure member which is connected with the connection heights or the connection crevice in an edge of a side besides said two or more valve block objects, and closes said penetration mainstream way (70), It has the attachment section (81 91) to said base member, and the manifold valve structure object (10) characterized by including the edge side holddown member (80 90) for fixing said mainstream way connection member and a mainstream way closure member, respectively is started.

[0009]

[Embodiment of the Invention] According to an attached drawing, this invention is explained to a detail below. The manifold valve structure object concerning one example of this invention drawing 1 a part The front view which has a notching cross section, Drawing 2 three to 3 sectional view of drawing 1 , and drawing 4 for 2 view Fig. of drawing 1 , and drawing 3 Four to 4 sectional view of drawing 1 , The partial perspective view showing the condition before connection of each valve block object [in / in drawing 5 / this manifold valve structure object] simple, The partial perspective view in which drawing 6 shows the holddown member for a mainstream way connection member and edge side connection members etc., the partial perspective view in which drawing 7 shows the holddown member for a mainstream way closure member and edge side closure members etc., and drawing 8 are the front views showing the busy condition which does not use the mainstream way closure member of this manifold valve structure object.

[0010] The manifold valve structure object 10 shown in drawing 1 thru/or drawing 4 is applied to one example of this invention, and contains the base member 11, the valve block objects 20A, 20B, and 20C of plurality (drawing three pieces), the mainstream way connection member 60, the mainstream way closure member 70, the holddown member 80 for edge side connection members, and the holddown member 90 for edge side closure members. This manifold valve structure object 10 is used for mixing two or more fluids by the predetermined flow rate, supplying as a mainstream object, or changing suitably two or more sorts of other fluids to the fluid of 1, and mixing, or distributing and supplying a predetermined fluid to two or more locations.

[0011] The base member 11 serves as the attachment section of each part material, and consists of a plate of

proper magnitude etc. In addition, the magnitude (flat-surface size, especially the die length of the valve block object connection direction X) of the base member 11 concerned is defined in consideration of the number of the valve block objects to connect, the magnitude of each valve block object, etc.

[0012] Each of two or more valve block objects 20A, 20B, and 20C (20) has the same structure mutually (of course depending on the case, some differences may be given.), is equipped with the fixed part 21 for attachment and the body 22 of a valve body to said base member 11, and consists of a block object constituted so that it could be used connecting more than one. From the lower part of transverse-plane 22a of the body 22 of a valve body, and tooth-back 22b, said fixed part 21 for attachment projected in one, was formed, and consists of examples. Holddown members, such as a screw-thread member for the sign B1 of illustration to fix said fixed part 21 for attachment to the base member 11, and B-2 are washers.

[0013] It is formed in an abbreviation rectangular parallelepiped and the connection crevice 25 corresponding to these connection heights 23 is established in the side the connection heights 23 and else (here right lateral) at the 1 side (here left lateral) of the body 22 of a valve body so that said body 22 of a valve body may be more easily understood from drawing 5. And at the time of the attachment to the base member 11 of the fixed part 21 for attachment of each valve block objects 20A, 20B, and 20C, each valve block objects 20A, 20B, and 20C are connected by engagement of the said connection heights 23 and the connection crevice 25 of the adjacent valve block objects 20A, 20B, and 20C. In addition, in the example, the seal members S1, such as packing, intervene between the engaged connection heights 23 and the connection crevice 25. Sign 21a of illustration is the mounting hole formed in said fixed part 21 for attachment.

[0014] While the heights side connection opening 24 is formed in said connection heights 23 and the crevice side connection opening 26 is formed in said connection crevice 25, respectively, moreover, in the body of valve body 22 interior concerned The valve chest 29 which holds said valve element 30 possible [an attitude] through the penetration mainstream way 27 which opens said heights side connection opening 24 and the crevice side connection opening 26 for free passage, the branching passage 28 which was open for free passage on this penetration mainstream way 27 from the upper part, and was formed in it free [closing motion] through the valve element 30, and this branching passage 28 is formed. Moreover, *-like valve seat 29a protrudes on the valve chest side opening 28o periphery of the branching passage 28 of said valve chest 29 wall. In addition, said penetration mainstream way 27 meets horizontally, and is formed, and said branching passage 28 is formed along the direction of a vertical by a diagram so that it may intersect perpendicularly with said penetration mainstream way 27.

[0015] Furthermore, the subpassage connection 50 which has said valve chest 29 and the subpassage 51 open for free passage is formed in the interior at the field side (here a transverse-plane side or a tooth-back side) which intersects perpendicularly with the field (here side face) in which said connection heights 23 and the connection crevice 25 of the body 22 of a valve body concerned are formed. The subpassage end connection 52 for carrying out outflow close [of various kinds of fluids (subfluid)] into the body 22 of a valve body is formed at the tip (edge of the opposite side of the valve chest 29) of said subpassage 51, and it connects with the external passage for fluid supply or discharge through this subpassage end connection 52. In addition, in this example, said subpassage 51 is formed along the direction which intersects perpendicularly with both said penetration mainstream ways 27 and branching passage 28.

[0016] As said valve element 30, the diaphragm valve element which moves with the proper valve drive 40 (here, it moves up and down) is used in this example. This diaphragm valve element 30 has the seal section 31 for closing motion of the circle configuration which opens and closes valve chest side opening 28o of the branching passage 28 of said valve seat 29a inside, the thin-walled part 32 formed in this seal section 31 outside for closing motion, the periphery attachment section 33 formed in this thin-walled part 32 outside, and the screwing section 34 screwed on the valve drive 40 (the below-mentioned actuation member 41) while being attached in said seal section 31 for closing motion. And said periphery attachment section 33 is equipped with the valve element 30 concerned in the valve chest 29 of said body 22 of a valve body. In addition, said seal section 31 for closing motion, a thin-walled part 32, and the periphery attachment section 33 consist of rubber or various plastics, and they are formed in one. Moreover, the screwing section 34 consists of a metal or plastics, and the plate-like part 35 prepared at the tip is laid under said seal section 31 for closing motion. In addition, in case the seal section 31 for closing motion of a valve element 30 closes valve chest side opening 28o of said branching passage 28 by being desirable, and the surface area (diameter) of said plate-like part 35 being larger than the opening area (diameter of opening) of valve chest side opening 28o of said branching passage 28, and carrying out, it is good for said plate-like part 35 to cover the whole valve chest side opening 28o of the branching passage 28. Then, while being able to carry

out the seal of the valve chest side opening of the branching passage 28 certainly by the valve element 30, the burden of a valve element 30 is also mitigated and endurance also improves. In addition, sign 29b in drawing 1 and 4 is an attachment crevice in which the periphery attachment section 33 of the valve element 30 formed in valve chest 29 wall is held.

[0017] The valve drive 40 which makes said valve element 30 move is formed in the body of valve body 22 upper part. The valve drive 40 in this example uses an electromagnetic-induction operation, and is constituted. In addition, as for the energization section and 45, the spring with which the actuation member which the sign 41 of illustration consists of a movable iron core which moves by the electromagnetic induction of the valve drive 45, and is screwed on the screwing section 34 of said valve element 30, and 42 energize the actuation member 41 to a coil, and 43 energizes it to the front (drawing lower part), and 44 are [a fixed block and 46] cases.

[0018] Drawing 1 and the condition by which it was shown in 4 here by the case where valve chest side opening 28o of said branching passage 28 is closed The actuation member 41 moves forward according to the energization force of a spring 43, and the seal section 31 for closing motion of the valve element 30 attached at the tip carries out a pressure welding to valve seat 29a in the valve chest 29, and closes valve chest side opening 28o of said branching passage 28. The installation to the valve chest 29 and the subpassage 51 of a fluid from the installation to the branching passage 28 of the fluid from the subpassage 51 or the penetration mainstream way 27 is intercepted. on the other hand, in the state of disconnection of valve chest side opening 28o of said branching passage 28 The actuation member 41 resists the energization force of a spring 43 by the electromagnetic induction of a coil 42, and it retreats. The seal section 31 for closing motion of the valve element 30 attached at the tip of this actuation member 41 is isolated from valve seat 29a in the valve chest 29, and opens valve chest side opening 28o of said branching passage 28. The fluid from the subpassage 51 is introduced to the branching passage 28, or the fluid from the penetration mainstream way 27 is introduced to the valve chest 29 and the subpassage 51.

[0019] In addition, each valve drive 40 (each valve element 30) formed in each valve block objects 20A, 20B, and 20C, respectively So that supply of a fluid and the change of supply interruption, and the change in the amount of supply can be adjusted for every valve block objects 20A, 20B, and 20C carry out mutually-independent, and enable it to operate, or Or each [valve drive 40] are related through a computer control system etc., and you may enable it to operate so that it can respond in coincidence supply of each fluid to each valve block objects 20A, 20B, and 20C, or mutual supply etc.

[0020] The mainstream way connection member 60 is a thing for supply into the manifold valve structure object 10 of the discharge to the exterior of the interflow object (mainstream object) with which two or more fluids (subfluid) which constitute an external connection as outflow admission into a club of the mainstream object in the manifold valve structure object 10 concerned, and were specifically supplied from each ***** 51 were mixed, or the predetermined fluid from the outside. This mainstream way connection member 60 is connected with the connection crevice 25 or the connection heights 23 in said 1 side edge section (end face located in the maximum outside) of two or more valve block objects 20A, 20B, and 20C. In addition, although the mainstream way connection member 60 concerned is connected with the connection crevice 25 established in the right lateral of valve block object 20A arranged in right-hand side in the example of illustration Connection heights 23 (it is equivalent to the connection heights 23 prepared in the left lateral of valve block object 20C arranged in left-hand side by a diagram.) prepared in the end face located in the maximum outside of not only this but two or more valve block objects 20A, 20B, and 20C You may make it connected.

[0021] The height for connection or the concave section for connection (drawing height 62 for connection) corresponding to the connection crevice 25 or the connection heights 23 of said valve block object is formed, and this part engages with the connection crevice 25 of said valve block object, or the connection heights 23, and is connected with the attachment side edge section 61 of said mainstream way connection member 60 so that I may be more easily understood from drawing 6 etc. Moreover, in the example of illustration, the seal members S2, such as packing, intervene between the connection crevice 25 of engaged valve block object 20A, and the height 62 for connection of the mainstream way connection member 60. Furthermore, the penetration mainstream way 27 of each of said valve block object and the connection passage 63 open for free passage are formed in said mainstream way connection member 60 interior. Furthermore, tip side opening (opposite side opening of a valve block object) of said connection passage 63 turns into the mainstream way end connection 64, and is connected with the external passage for fluid discharge or supply through this mainstream way end connection 64. In addition, in the mainstream way connection member 60 of illustration, said attachment side edge section 61 (however, the height 62 for

connection is removed.) is formed in the shape of [of a major diameter] a flange from the other sections. [0022] The mainstream way closure member 70 closes the end side opening part of the penetration mainstream way 27 in the edge of a side besides said two or more valve block objects 20A, 20B, and 20C, i.e., the opposite side edge of said mainstream way connection member 60, (end face located in the maximum outside) (it closes). This mainstream way closure member 70 is connected with the connection heights 23 or the connection crevice 25 in said opposite side edge of the mainstream way connection member 60 of two or more valve block objects 20A, 20B, and 20C. In addition, in the example of illustration, although the mainstream way closure member 70 concerned is connected with the connection heights 23 prepared in the left lateral of valve block object 20C arranged in left-hand side, it is not limited to this. For example, when said mainstream way connection member 60 is connected with the connection heights 23 prepared in the left lateral of valve block object 20C arranged in left-hand side, said mainstream way closure member 70 may be made to be connected with the connection crevice 25 established in the right lateral of valve block object 20C arranged in right-hand side.

[0023] It has the pillar-shaped or tubed closure section 71 which has an outer diameter corresponding to the bore of said penetration mainstream way 27, and the closure of this penetration mainstream way 27 is carried out by inserting this closure section 71 from end side opening of said penetration mainstream way 27 so that said mainstream way closure member 70 may be better understood from drawing 7. Moreover, the attachment side edge section 72 of the mainstream way closure member 70 is formed in the shape of [of a major diameter] a flange from said closure section 71. In the attachment side edge section 72 The concave section for connection or the height for connection (drawing concave section 73 for connection) corresponding to the connection heights 23 or the connection crevice 25 of said valve block object is formed, and this part engages with the connection heights 23 of said valve block object, or the connection crevice 25, and is connected. In addition, in the example of illustration, the seal members S3, such as packing, intervene between the connection heights 23 of engaged valve block object 20C, and the concave section 73 for connection of the mainstream way closure member 70.

[0024] Said mainstream way connection member 60 and the mainstream way closure member 70 are being fixed to the base member 11 by the edge side holddown member 80 or 90. The holddown member 80 for edge side connection members which fixes said mainstream way connection member 60 has the tabular attachment section 81 to the base member 11, and the presser-foot section 85 which is set up by this attachment section 81 and presses down the attachment side edge section 61 of the shape of a flange of the mainstream way connection member 60 from an outside so that I may be understood from drawing 6. And this holddown member 80 for edge side connection members is fixed to the base member 11 through said attachment section 81 so that said presser-foot section 85 may contact lateral-surface 61a of the attachment side edge section 61 of said mainstream way connection member 60, after attaching to the valve block object of said mainstream way connection member 60. Holddown members, such as a screw-thread member for the mounting hole formed in said attachment section 81 and 83 to fix said attachment section 81 to the base member 11, as for the sign 82 of illustration, and 84 are the notching sections formed in a washer and said presser-foot section 85 made more possible [insertion of the general section 65 by the side of a tip (narrow diameter portion)] for 86 than the attachment side edge section 61 of the mainstream way connection member 60. In addition, the presser-foot section 85 of the holddown member 80 for edge side connection members may be pressed down by two plate-like parts set up in parallel at spacing (distance) which becomes size, and may constitute the section from an outer-diameter dimension of what [not only] has said notching section 86 but the general section 65 of said mainstream way connection member 60.

[0025] On the other hand, the holddown member 90 for edge side closure members which fixes said mainstream way closure member 70 has the attachment section 91 to the base member 11, and the presser-foot section 95 which is set up by this attachment section 91 and presses down the attachment side edge section 72 of the shape of a flange of the mainstream way closure member 70 from an outside so that I may be understood from drawing 7. Said attachment section 91 of illustration is formed in the shape of plane view abbreviation KO. And this holddown member 80 for edge side closure members is fixed to the base member 11 through said attachment section 91 so that said presser-foot section 95 may contact lateral-surface 72a of the attachment side edge section 72 of said mainstream way closure member 70, after attaching to the valve block object of said mainstream way closure member 70. Holddown members, such as a screw-thread member for the mounting hole where the sign 92 of illustration was formed in the two piece sections 91a and 91b which said attachment section 91 counters, and 93 to fix said attachment section 91 to the base member 11, and 94 are washers. In addition, in the example of illustration, distance between two piece sections 91a in the attachment section 91 of said holddown member 90 for edge side closure members

which counters, and 91b is carry out at least to more than the depth dimension (distance from a transverse plane to a flat surface) of the valve block object lower part, and the aforementioned piece sections 91a and 91b are locate in both the outsides (a transverse-plane side and tooth-back side) of a valve block object. Contraction-izing of the tooth space which immobilization of the mainstream way closure member 70 takes to this, as a result contraction-ization of the base member 11 can be attained.

[0026] Next, actuation of the manifold valve structure object 10 of the above-mentioned structure is explained. First, the actuation in the case of using in order to mix subfluids, such as pure water and a chemical, by the predetermined flow rate and to supply the manifold valve structure object 10 concerned as a mainstream object is described. First, each fluid (subfluid) which entered in the manifold valve structure object 10 fills the valve chest 29 through said subpassage 51 from the subpassage end connection 52 of each of said valve block objects 20A, 20B, and 20C. Subsequently, if each valve element 30 of each valve block objects 20A, 20B, and 20C retreats (here, it goes up) and said branching passage 28 opens, each fluid of a predetermined flow rate will be supplied in said penetration mainstream way 27 through this branching passage 28, and each fluid will be mixed. And the interflow object flows out of the mainstream way end connection 64 of the connection passage 63 of said mainstream way connection member 60 as a mainstream object. On the other hand, if any of each valve element 30 of each valve block objects 20A, 20B, and 20C they are moves forward by the electromagnetic induction of said valve drive 40 (here, it descends), the branching passage 28 corresponding to this valve element 30 will be closed, and supply on the penetration mainstream way 27 of the fluid corresponding to it will stop.

[0027] Then, in order to distribute and supply a predetermined fluid to two or more locations, the actuation in the case of using the manifold valve structure object 10 concerned is described. While first the fluid which entered in the manifold valve structure object 10 from the mainstream way end connection 64 of the connection passage 63 of said mainstream way connection member 60 fills said penetration mainstream way 27, the fluid flows in each branching passage 28 of each valve block objects 20A, 20B, and 20C. Subsequently, if each valve element 30 of each of said valve block objects 20A, 20B, and 20C retreats (here, it goes up) and valve chest side opening 28o of said branching passage 28 opens, the fluid of a predetermined flow rate will flow in said each valve chest 29 and each ***** 51, and will flow out of each ***** end connection 52 of account of back to front each of that ***** 51 out of the valve structure object 10. On the other hand, if any of each valve element 30 of each valve block objects 20A, 20B, and 20C they are moves forward by the electromagnetic induction of said valve drive 40 (here, it descends), valve chest side opening 28o of the branching passage 28 corresponding to this valve element 30 will be closed, and the inflow (supply) to the valve chest 29 of a fluid will stop.

[0028] In addition, this invention is not limited to the above-mentioned example, and in the range which does not deviate from the meaning of invention, a part of configuration can be changed suitably and it can carry it out. For example, although three valve block objects are connected, you may make it connect two valve block objects, and may make it connect four or more valve block objects in the above-mentioned example. That is, it can respond to various users' needs, i.e., the number of a variety of subfluids, (or the number of the work sites which carry out distribution supply of the fluid) easily only by choosing the number of valve block objects suitably, and excels in versatility. moreover, the number after installation of a manifold valve structure object and of said subfluids (or the number of the work sites which carry out distribution supply of the fluid) -- it will be necessary to change -- ** -- moreover, it can respond by low cost simply [it] and promptly.

[0029] Moreover, although the end side of the penetration mainstream way 27 is used in the above-mentioned example, closing by the mainstream way closure member 70 As it is not limited to this but is shown in drawing 8 , the mainstream way connection members 60 and 60 are connected with both the connection heights 23 in the both-sides edge (end face located in the maximum outside) of two or more valve block objects 20A, 20B, and 20C, and the connection crevice 25. The both-ends side of the penetration mainstream way 27 may be opened wide, the mainstream way end connection 64 of one mainstream way connection member 60 may be made into the tap hole of the mainstream object of an interflow object etc., and the mainstream way end connection 64 of the mainstream way connection member 60 of another side may be used so that it may become the input of said mainstream object. That is, the selection of the use mode according to the application which a user desires of the manifold valve structure object 10 of this invention is attained by using suitably the mainstream way connection member 60 and the mainstream way closure member 70.

[0030]

[Effect of the Invention] In the manifold valve structure object applied to this invention as it illustrates

above and being explained Since mutually-independent [of each valve block object which has a penetration mainstream way, branching passage, the valve chest a valve element, a valve drive, subpassage, etc., respectively] is carried out and it is constituted by seeing suitably these several sets of valve block objects, the manifold valve structure object corresponding to the number (or the number of the locations which carry out distribution supply of the fluid) of the fluids (subfluid) supplied to the interior of a user's various needs, i.e., a valve structure object, can be offered easily, and it excels in versatility extremely. moreover, the number of the fluids which supply the manifold valve structure object concerned to the interior after the installation (or the number of the locations which carry out distribution supply of the fluid) -- it will be necessary to change -- ** -- moreover, it can respond by low cost simply [it] and promptly.

[0031] Moreover, the mainstream way closure member which closes the mainstream way connection member [used as a connection with the exterior], and end side of a mainstream way The connection heights or the connection crevice established in each valve block object in order to connect each valve block objects, and connection are attained. It is constituted so that said mainstream way connection member or a mainstream way closure member may be connected with the connection crevice or connection heights which is not used for the connection in the edge of the connected valve block object. Therefore, each valve block object of each other to connect can be made into the same structure, namely, it ends with one kind of valve block object, and is very advantageous on cost and a design. Furthermore, if it is in the manifold valve structure object concerned, since it is fixed to the base member through the edge side holddown member, respectively, said mainstream way connection member and a mainstream way closure member can prevent this mainstream way connection member and a mainstream way closure member escaping from a valve block object, or separating.

[Translation done.]

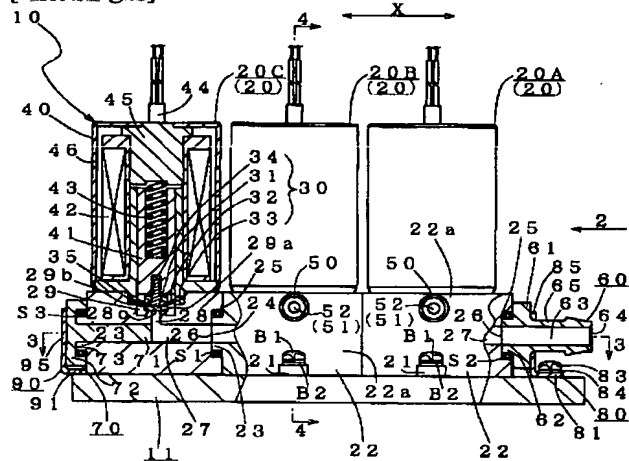
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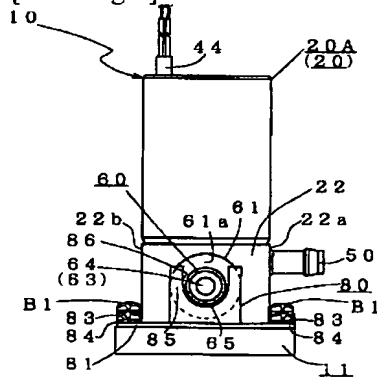
1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DRAWINGS

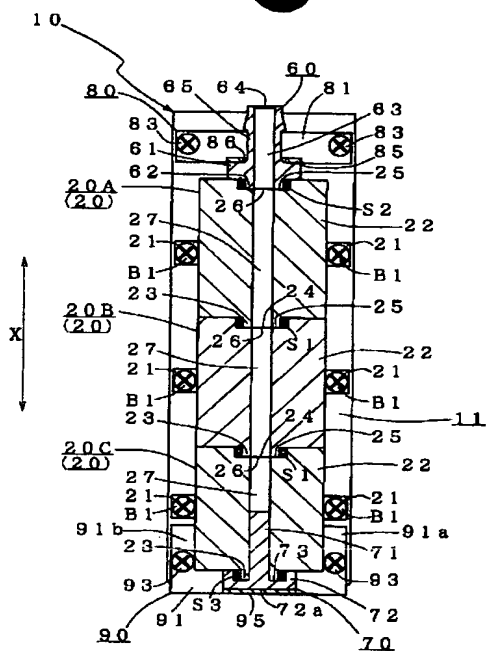
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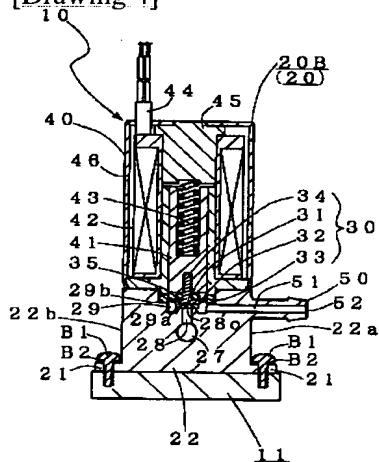
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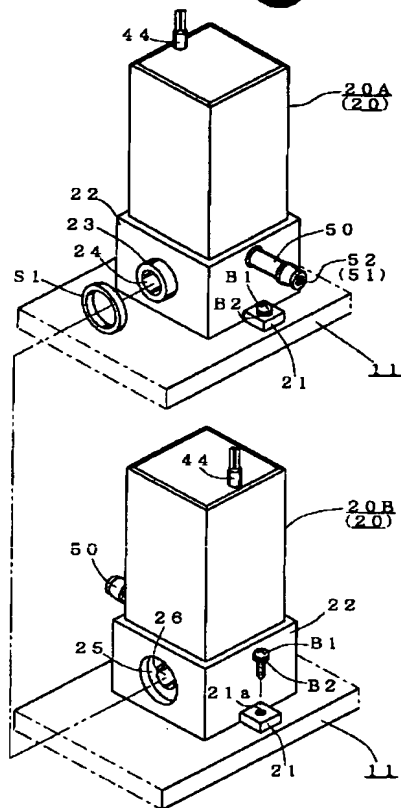
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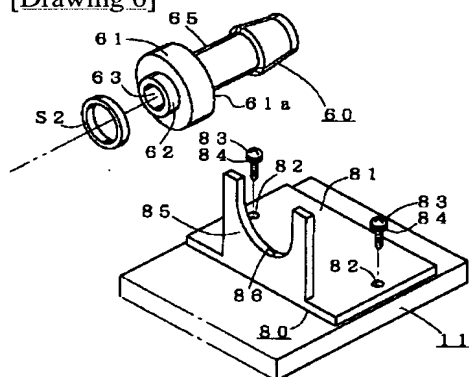
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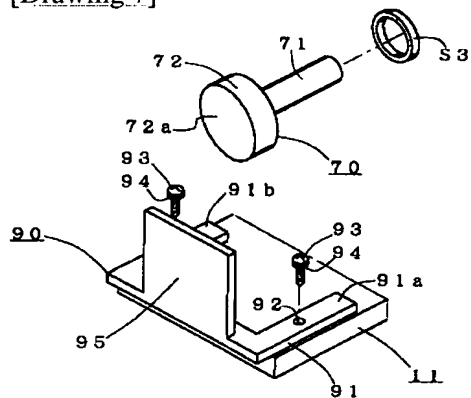
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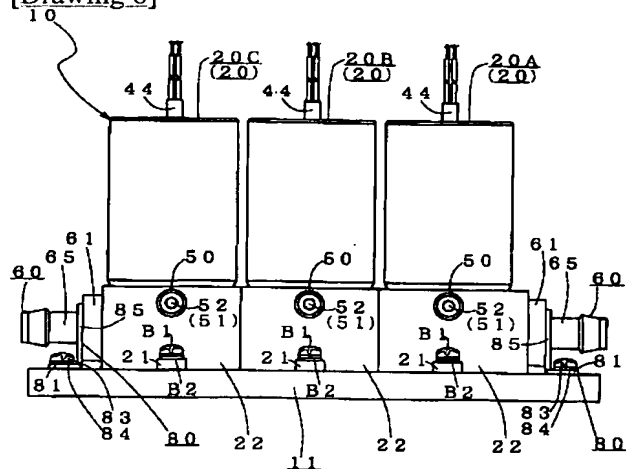
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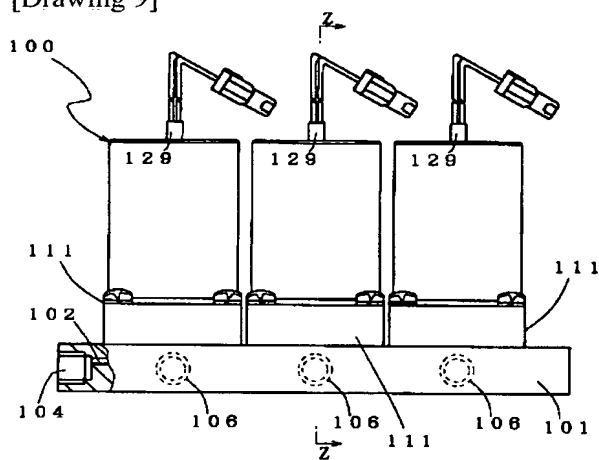
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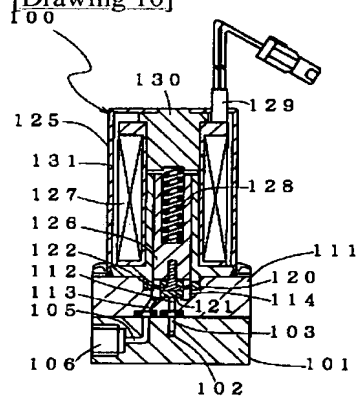
[Drawing 8]



[Drawing 9]



[Drawing 10]



[Translation done.]

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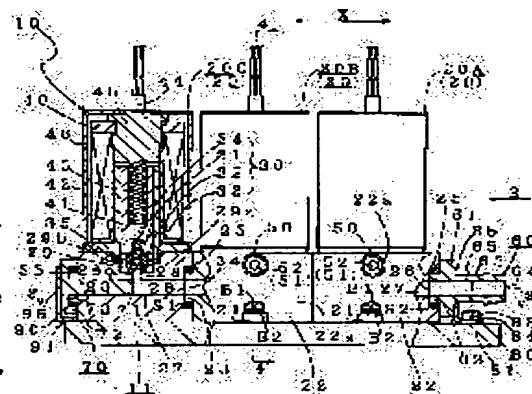
(71)Applicant : ADVANCE DENKI KOGYO KK

(22)Date of filing : 19.03.2001

(72)Inventor : KONDO KUNIO
MIWA TAKAHIRO**(54) MANIFOLD VALVE STRUCTURE BODY****(57)Abstract:**

PROBLEM TO BE SOLVED: To provide a manifold structure body excellent in a general purpose for use.

SOLUTION: The manifold valve structure body 10 has a base member 11; a mounting fixed part 21; a connection projection part provided at one side; and a connection recessed part 25 provided so as to correspond to the connection projection part. The manifold valve structure body 10 includes a plurality of valve block bodies 20A, 20B, 20C comprising a block body constituted such that a plurality of block bodies are connected to each other to use it; a main flow passage connection member 60 having a connection flow passage 63 connected to a connection recessed part or a connection projection part at one side end of a plurality of valve block bodies to be communicated with a penetration main flow passage 27 of the valve block body, a main flow passage sealing member 70 connected to a connection projection part or a connection recessed part at the other side end of a plurality of valve block bodies to seal the penetration main flow passage; and end side fixing members 80, 90 for fixing the main flow passage connection member and the main flow passage sealing member respectively.

**LEGAL STATUS**

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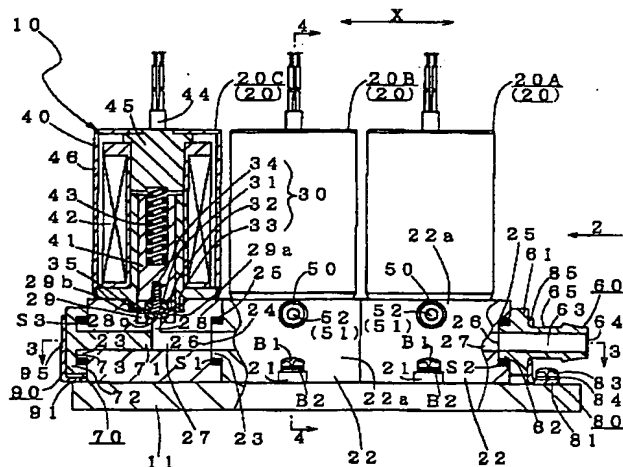
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(54) 【発明の名称】 マニホールド弁構造体

(57) 【要約】

【課題】 汎用性に優れるマニホールド弁構造体を提供する。

【解決手段】 ベース部材 11 と、ベース部材への取付用固定部 21 と一側に設けられた連結凸部 23 と他側に連結凸部に対応するように設けられた連結凹部 25 を有し、複数個連結して使用できるように構成されたブロック体よりなる複数の弁ブロック体 20A、20B、20C と、複数の弁ブロック体の一侧端部における連結凹部又は連結凸部に連結されて弁ブロック体の貫通主流路 27 と連通される接続流路 63 を有する主流路接続部材 60 と、複数の弁ブロック体の他側の端部における連結凸部又は連結凹部に連結されて貫通主流路を封止する主流路封止部材 70 と、主流路接続部材及び主流路封止部材をそれぞれ固定する端部側固定部材 80、90 とを含むマニホールド弁構造体 10。



【特許請求の範囲】

【請求項1】 ベース部材(11)と、

該ベース部材への取付用固定部(21)を備え、パブルボディ本体(22)の一侧には連結凸部(23)、他側には該連結凸部に対応する連結凹部(25)を有し、複数個連結して使用できるように構成されたブロック体よりなり、前記連結凸部内に形成された凸部側連結開口

(24)と、前記連結凹部内に形成された凹部側連結開口(26)と、前記凸部側連結開口と凹部側連結開口を連通する貫通主流路(27)と、該貫通主流路に連通し

弁体(30)を介して開閉自在に形成された分岐流路(28)と、該分岐流路と通じ前記弁体を収容する弁室(29)と、前記弁体を作動させる弁駆動機構(40)と、先端に副流路接続口(52)が形成され前記弁室と連通する副流路(51)を有する副流路接続部(50)を備えた複数の弁ブロック体(20A, 20B, 20C)と、

前記複数の弁ブロック体の一侧端部における連結凹部又は連結凸部に連結されて前記貫通主流路と連通される接続流路(63)を有する主流路接続部材(60)と、

前記複数の弁ブロック体の他側の端部における連結凸部又は連結凹部に連結されて前記貫通主流路を封止する主流路封止部材(70)と、

前記ベース部材への取付部(81, 91)を有し、前記主流路接続部材及び主流路封止部材をそれぞれ固定するための端部側固定部材(80, 90)とを含むことを特徴とするマニホールド弁構造体(10)。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】 この発明は、マニホールド弁構造体に関する。

【0002】

【従来の技術】 水や薬品等の複数の流体を所定流量で混合して主流体(混合流体)として供給したり、一の流体に複数種の他の流体を適宜切り替えて混入して供給するため、或いは一の流体を複数の場所へ分配して供給するため、図9及び図10に示すようなマニホールド弁構造体100が用いられることがある。

【0003】 前記マニホールド弁構造体100は、主ブロック体101と、複数の弁ブロック体111よりなる。前記主ブロック体101には、その長手方向に沿う水平方向の貫通主流路102が形成されていると共に、主ブロック体101の上面から前記貫通主流路102に連通する複数の主ブロック側分岐流路103が主ブロック体101の長手方向に所定間隔で形成されている。また、前記貫通主流路102の一端部には、外部流路と接続するための主接続部104が流体流出入部として設けられている。さらに、当該主ブロック体101においては、その上面から正面又は背面又は側面に貫通する主ブロック側副流路105が前記主ブロック体101の長手

方向に所定間隔で複数形成されている。なお、前記各主ブロック側副流路105の一端部(上面以外の面側の端部)には、外部流路と接続するための副接続部106が流体流出入部として設けられている。

【0004】 一方、弁ブロック体111は、前記主ブロック体101の上面に複数個(図示の例では3個)並設されている。それぞれの弁ブロック体111の下部には、前記主ブロック体101の各主ブロック側分岐流路103及び各主ブロック側副流路105と通じる弁ブロック側分岐流路112及び弁ブロック側副流路113が上下方向や斜め方向等に形成されると共に、前記弁ブロック側分岐流路112及び弁ブロック側副流路113と通じる弁室114が形成され、該弁室114には前記弁ブロック側分岐流路112を開閉する弁体120が進退可能に収容されている。前記弁体120は適宜の弁駆動機構125により進退するようになっている。図示の例では、前記弁体120には公知のダイヤフラム弁体を用いられ、また、該弁体120を進退させる弁駆動機構125は電磁誘導作用を利用するものからなっている。なお、図示の符号121は弁体120の開閉用シール部、122は弁体120の外周取付部、126は弁駆動機構125の電磁誘導によって進退する可動鉄芯からなつて弁体120に取り付けられる作動部材、127はコイル、128は作動部材126を前方へ付勢するバネ、129は通電部、130は固定ブロック、131はケースである。

【0005】 前記構造のマニホールド弁構造体100においては、前記複数の主ブロック側副流路105の副接続部106に、適宜の流体を供給する供給装置が外部流路を介して接続される。そして、必要に応じて前記弁ブロック体111の弁駆動機構125により弁体120を作動させて前記弁ブロック側分岐流路112が開放されることによって、流体が貫通主流路102内に所定量供給される。なお、複数種の流体を切り替えて貫通主流路102内に供給する場合には、必要とされる流体に対応する弁ブロック体111の弁ブロック側分岐流路112を弁体120の作動によって開き、必要とされない流体に対応する弁ブロック体111の弁ブロック側分岐流路112を弁体120によって閉じるようにすれば良い。

【0006】 しかしながら、上記従来のマニホールド弁構造体100にあつては、ユーザーのニーズに合わせ、供給(混入)する流体の数等に対応できるように、言い換えれば、組み合わせる弁ブロック体111の数に合致するように、その都度主ブロック体101を設計しなければならず、汎用性に乏しいのみならず、コスト的にも不利であった。また、当該マニホールド弁構造体にあつては、その設置後、供給する流体の数を増減させる必要が生じたときには、組み合わせる弁ブロック体111の数に合わせて主ブロック体101を新たに設計変更して取り替える必要が生じるので、手間がかかると共に

経済的ではなかった。

【0007】

【発明が解決しようとする課題】本発明は前記の点に鑑みて提案されたものであって、汎用性に優れると共に、設置後において供給する流体の数等を変更する場合にも簡単かつ迅速に対応でき、しかもコスト的にも有利なマニホールド弁構造体を提供しようとするものである。

【0008】

【課題を解決するための手段】すなわち、この発明は、ベース部材(11)と、該ベース部材への取付用固定部(21)を備え、バルブボディ本体(22)の一侧には連結凸部(23)、他側には該連結凸部に対応する連結凹部(25)を有し、複数個連結して使用できるように構成されたブロック体よりなり、前記連結凸部内に形成された凸部側連結開口(24)と、前記連結凹部内に形成された凹部側連結開口(26)と、前記凸部側連結開口と凹部側連結開口を連通する貫通主流路(27)と、該貫通主流路に連通し弁体(30)を介して開閉自在に形成された分岐流路(28)と、該分岐流路と通じ前記弁体を収容する弁室(29)と、前記弁体を作動させる弁駆動機構(40)と、先端に副流路接続口(52)が形成され前記弁室と連通する副流路(51)を有する副流路接続部(50)を備えた複数の弁ブロック体(20A, 20B, 20C)と、前記複数の弁ブロック体の一侧端部における連結凹部又は連結凸部に連結されて前記貫通主流路と連通される接続流路(63)を有する主流路接続部材(60)と、前記複数の弁ブロック体の他側の端部における連結凸部又は連結凹部に連結されて前記貫通主流路を封止する主流路封止部材(70)と、前記ベース部材への取付部(81, 91)を有し、前記主流路接続部材及び主流路封止部材をそれぞれ固定するための端部側固定部材(80, 90)とを含むことを特徴とするマニホールド弁構造体(10)に係る。

【0009】

【発明の実施の形態】以下添付の図面に従ってこの発明を詳細に説明する。図1はこの発明の一実施例に係るマニホールド弁構造体の一部切り欠き断面を有する正面図、図2は図1の2矢視図、図3は図1の3-3断面図、図4は図1の4-4断面図、図5は同マニホールド弁構造体における各弁ブロック体の連結前の状態を簡略に示す部分斜視図、図6は主流路接続部材及び端部側接続部材用固定部材等を示す部分斜視図、図7は主流路封止部材及び端部側封止部材用固定部材等を示す部分斜視図、図8は同マニホールド弁構造体の主流路封止部材を用いない使用状態を示す正面図である。

【0010】図1ないし図4に示すマニホールド弁構造体10は、この発明の一実施例に係るものであり、ベース部材11と、複数(図では3個)の弁ブロック体20A, 20B, 20Cと、主流路接続部材60と、主流路封止部材70と、端部側接続部材用固定部材80と、端

部側封止部材用固定部材90とを含んでいる。このマニホールド弁構造体10は、複数の流体を所定流量で混合して主流体として供給したり、一の流体に複数種の他の流体を適宜切り替えて混入したり、或いは所定流体を複数の場所へ分配して供給したりするのに使用される。

【0011】ベース部材11は、各部材の取付部となるもので、適宜の大きさの板状体等からなる。なお、当該ベース部材11の大きさ(平面サイズ、特に弁ブロック体連結方向Xの長さ)は、連結する弁ブロック体の数や各弁ブロック体の大きさ等を考慮して定められる。

【0012】複数の弁ブロック体20A, 20B, 20C(20)の各々は、互いに同一構造となっており(勿論、場合によっては多少の相違をもたせても良い)、前記ベース部材11への取付用固定部21とバルブボディ本体22とを備え、複数個連結して使用できるように構成されたブロック体よりなる。実施例では、前記取付用固定部21は、バルブボディ本体22の正面22a及び背面22bの下部から一体的に突出形成されたもので構成されている。図示の符号B1は前記取付用固定部21をベース部材11に固定するためのねじ部材等の固定部材、B2は座金である。

【0013】前記バルブボディ本体22は、図5からより容易に理解されるように、略直方体に形成され、そのバルブボディ本体22の一侧(ここでは左側面)には連結凸部23、他側(ここでは右側面)には該連結凸部23に対応する連結凹部25が設けられている。そして、各弁ブロック体20A, 20B, 20Cの取付用固定部21のベース部材11への取付時には、隣り合う弁ブロック体20A, 20B, 20Cの前記連結凸部23と連結凹部25の係合によって各弁ブロック体20A, 20B, 20Cが連結される。なお、実施例では、係合する連結凸部23と連結凹部25間には、パッキン等のシール部材S1が介在されている。図示の符号21aは前記取付用固定部21に形成された取付孔である。

【0014】また、前記連結凸部23内には凸部側連結開口24が、前記連結凹部25内には凹部側連結開口26がそれぞれ形成されていると共に、当該バルブボディ本体22内部には、前記凸部側連結開口24と凹部側連結開口26を連通する貫通主流路27と、該貫通主流路27にその上方から連通し弁体30を介して開閉自在に形成された分岐流路28と、該分岐流路28と通じ前記弁体30を進退可能に収容する弁室29が形成されている。また、前記弁室29内壁の分岐流路28の弁室側開口28o周縁には、突状の弁座29aが突設されている。なお、図では、前記貫通主流路27は水平方向に沿って形成され、前記分岐流路28は前記貫通主流路27に直交するように鉛直方向に沿って形成されている。

【0015】さらに、当該バルブボディ本体22の前記連結凸部23及び連結凹部25が形成される面(ここでは側面)に直交する面側(ここでは正面側或いは背面

側)には、内部に前記弁室29と連通する副流路51を有する副流路接続部50が設けられている。前記副流路51の先端(弁室29の反対側の端)には、各種の流体(副流体)をバルブボディ本体22内に流し入れさせるための副流路接続口52が形成され、該副流路接続口52を介して流体供給或いは排出用の外部流路と接続される。なお、この実施例では、前記副流路51は、前記貫通主流路27と分岐流路28の両方に直交する方向に沿って形成されている。

【0016】前記弁体30として、この実施例では適宜の弁駆動機構40により進退(ここでは上下動)するダイヤフラム弁体を用いられている。このダイヤフラム弁体30は、前記弁座29a内側の分岐流路28の弁室側開口28oを開閉する円形状の開閉用シール部31と、該開閉用シール部31外側に形成された薄肉部32と、該薄肉部32外側に形成された外周取付部33と、前記開閉用シール部31に取り付けられると共に弁駆動機構40(後述の作動部材41)に螺着される螺着部34を有している。そして、当該弁体30は、前記外周取付部33によって前記バルブボディ本体22の弁室29内に装着されている。なお、前記開閉用シール部31、薄肉部32、外周取付部33はゴム又は各種プラスチックからなり、それらは一体的に形成されている。また、螺着部34は金属やプラスチックからなり、その先端に設けられた板状部35が前記開閉用シール部31に埋設されている。なお、好ましくは、前記板状部35の表面積(直径)は前記分岐流路28の弁室側開口28oの開口面積(開口径)より大きくすることによって、弁体30の開閉用シール部31が前記分岐流路28の弁室側開口28oを閉じる際に、前記板状部35が分岐流路28の弁室側開口28o全体を覆うようにするのが良い。そうすれば、弁体30で分岐流路28の弁室側開口を確実にシールすることができると共に、弁体30の負担も軽減されて、耐久性も向上する。なお、図1、4中の符号29bは弁室29内壁に形成された弁体30の外周取付部33が収容される取付凹部である。

【0017】前記弁体30を進退させる弁駆動機構40は、バルブボディ本体22上部に設けられる。この実施例における弁駆動機構40は、電磁誘導作用を利用するもので構成されている。なお、図示の符号41は弁駆動機構45の電磁誘導によって進退する可動鉄芯からなっており、前記弁体30の螺着部34に螺着される作動部材、42はコイル、43は作動部材41を前方(図では下方)へ付勢するバネ、44は通電部、45は固定ブロック、46はケースである。

【0018】ここで、図1、4に示された状態は、前記分岐流路28の弁室側開口28oを閉鎖している場合で、作動部材41がバネ43の付勢力によって前進して、その先端に取り付けられた弁体30の開閉用シール部31が弁室29内の弁座29aに圧接して前記分岐流

路28の弁室側開口28oを閉鎖して、副流路51からの流体の分岐流路28への導入、或いは貫通主流路27からの流体の弁室29及び副流路51への導入を遮断している。これに対して、前記分岐流路28の弁室側開口28oの開放状態では、コイル42の電磁誘導により作動部材41がバネ43の付勢力に抗して後退して、該作動部材41の先端に取り付けられた弁体30の開閉用シール部31が弁室29内の弁座29aから離隔して前記分岐流路28の弁室側開口28oを開いて、副流路51からの流体を分岐流路28へ導入し、或いは貫通主流路27からの流体を弁室29及び副流路51へ導入する。

【0019】なお、各弁ブロック体20A、20B、20Cにそれぞれ設けられた各弁駆動機構40(各弁体30)は、各弁ブロック体20A、20B、20C毎に流体の供給及び供給停止の切り替えや供給量の増減の調整を行えるよう互いに独立して作動できるようにしたり、或いは各弁ブロック体20A、20B、20Cへの各流体の同時供給や交互供給の場合等に対応できるよう各弁駆動機構40同士を、コンピュータ制御装置等を介して関連させて作動できるようにしても良い。

【0020】主流路接続部材60は、当該マニホールド弁構造体10における主流体の流出入口として外部接続部を構成するもので、具体的には各副流路51から供給された複数の流体(副流体)が混合された混合流体(主流体)の外部への排出、或いは外部からの所定流体のマニホールド弁構造体10内への供給のためのものである。この主流路接続部材60は、前記複数の弁ブロック体20A、20B、20Cの一侧端部(最外側に位置する端面)における連結凹部25又は連結凸部23に連結される。なお、図示の例では、当該主流路接続部材60は、右側に配設された弁ブロック体20Aの右側面に設けられた連結凹部25に連結されているが、これに限らず、複数の弁ブロック体20A、20B、20Cの最外側に位置する端面に設けられた連結凸部23(図では左側に配設された弁ブロック体20Cの左側面に設けられた連結凸部23に相当する。)に連結されるようにしても良い。

【0021】図6等からより容易に理解されるように、前記主流路接続部材60の取付側端部61には、前記弁ブロック体の連結凹部25又は連結凸部23に対応する連結用凸状部又は連結用凹状部(図では連結用凸状部62)が形成され、この部分が前記弁ブロック体の連結凹部25又は連結凸部23と係合して連結されるようになっている。また、図示の例では、係合する弁ブロック体20Aの連結凹部25と主流路接続部材60の連結用凸状部62間には、パッキン等のシール部材S2が介在されている。さらに、前記主流路接続部材60内部には、前記各弁ブロック体の貫通主流路27と連通する接続流路63が形成されている。またさらに、前記接続流路63の先端側開口(弁ブロック体の反対側開口)は主流路

接続口 64 となり、該主流路接続口 64 を介して流体排出或いは供給用の外部流路と接続される。なお、図示の主流路接続部材 60 においては、前記取付側端部 61

(但し、連結用凸状部 62 を除く。) は、他部より大径のフランジ状に形成されている。

【0022】主流路封止部材 70 は、前記複数の弁ブロック体 20A, 20B, 20C の他側の端部、つまり前記主流路接続部材 60 の反対側端部 (最外側に位置する端面) における貫通主流路 27 の一端側開口部分を封止する (塞ぐ) ものである。この主流路封止部材 70 は、前記複数の弁ブロック体 20A, 20B, 20C の主流路接続部材 60 の反対側端部における連結凸部 23 又は連結凹部 25 に連結される。なお、図示の例では、当該主流路封止部材 70 は、左側に配設された弁ブロック体 20C の左側面に設けられた連結凸部 23 に連結されているが、これに限定されない。例えば、前記主流路接続部材 60 が左側に配設された弁ブロック体 20C の左側面に設けられた連結凸部 23 に連結される場合等には、前記主流路封止部材 70 は右側に配設された弁ブロック体 20C の右側面に設けられた連結凹部 25 に連結されるようにしても良い。

【0023】前記主流路封止部材 70 は、図 7 からよりよく理解されるように、前記貫通主流路 27 の内径に対応した外径を有する柱状又は筒状の封止部 71 を有し、該封止部 71 が前記貫通主流路 27 の一端側開口から挿入されることによって該貫通主流路 27 が封止されるようになっている。また、主流路封止部材 70 の取付側端部 72 は、前記封止部 71 より大径のフランジ状に形成され、その取付側端部 72 には、前記弁ブロック体の連結凸部 23 又は連結凹部 25 に対応する連結用凹状部又は連結用凸状部 (図では連結用凹状部 73) が形成され、この部分が前記弁ブロック体の連結凸部 23 又は連結凹部 25 と係合して連結されるようになっている。なお、図示の例では、係合する弁ブロック体 20C の連結凸部 23 と主流路封止部材 70 の連結用凹状部 73 間には、パッキン等のシール部材 S3 が介在されている。

【0024】前記主流路接続部材 60 及び主流路封止部材 70 は、端部側固定部材 80 又は 90 によって、ベース部材 11 に固定されている。前記主流路接続部材 60 を固定する端部側接続部材用固定部材 80 は、図 6 から理解されるように、ベース部材 11 への板状の取付部 81 と、該取付部 81 に立設され主流路接続部材 60 のフランジ状の取付側端部 61 を外側から押さえる押さえ部 85 を有している。そして、この端部側接続部材用固定部材 80 は、前記主流路接続部材 60 の弁ブロック体への取付後、前記押さえ部 85 が前記主流路接続部材 60 の取付側端部 61 の外側面 61a に当接するように、前記取付部 81 を介してベース部材 11 に固定される。図示の符号 82 は前記取付部 81 に形成された取付孔、83 は前記取付部 81 をベース部材 11 に固定するための

ねじ部材等の固定部材、84 は座金、86 は主流路接続部材 60 の取付側端部 61 より先端側の一般部 (小径部) 65 を挿通可能とする前記押さえ部 85 に形成された切り欠き部である。なお、端部側接続部材用固定部材 80 の押さえ部 85 は、前記切り欠き部 86 を有するものに限らず、例えば、前記主流路接続部材 60 の一般部 65 の外径寸法よりも大なる間隔 (距離) で平行に立設した 2 本の板状部により押さえ部を構成しても良い。

【0025】一方、前記主流路封止部材 70 を固定する端部側封止部材用固定部材 90 は、図 7 から理解されるように、ベース部材 11 への取付部 91 と、該取付部 91 に立設され主流路封止部材 70 のフランジ状の取付側端部 72 を外側から押さえる押さえ部 95 を有している。図示の前記取付部 91 は、平面視略コ状に形成されている。そして、この端部側封止部材用固定部材 80 は、前記主流路封止部材 70 の弁ブロック体への取付後、前記押さえ部 95 が前記主流路封止部材 70 の取付側端部 72 の外側面 72a に当接するように、前記取付部 91 を介してベース部材 11 に固定される。図示の符号 92 は前記取付部 91 の対向する 2 つの片部 91a, 91b に形成された取付孔、93 は前記取付部 91 をベース部材 11 に固定するためのねじ部材等の固定部材、94 は座金である。なお、図示の例では、前記端部側封止部材用固定部材 90 の取付部 91 における対向する 2 つの片部 91a, 91b 間の距離は、少なくとも弁ブロック体下部の奥行き寸法 (正面から平面までの距離) 以上とされ、前記片部 91a, 91b が弁ブロック体の両外側 (正面側及び背面側) に位置するようになっている。これにより主流路封止部材 70 の固定に要するスペースの縮小化、ひいてはベース部材 11 の縮小化を図ることができる。

【0026】次に、上記構造のマニホールド弁構造体 10 の作動について説明する。まず、当該マニホールド弁構造体 10 を、純水や薬品等の副流体を所定流量で混合して主流体として供給するために用いる場合における作動について述べる。最初に、前記各弁ブロック体 20A, 20B, 20C の副流路接続口 52 からマニホールド弁構造体 10 内に入った各流体 (副流体) は、前記副流路 51 を経て弁室 29 を満たす。次いで、各弁ブロック体 20A, 20B, 20C の各弁体 30 が後退 (ここでは上昇) し、前記分岐流路 28 が開くと、該分岐流路 28 を介して所定流量の各流体が前記貫通主流路 27 内に供給され、各流体が混合される。そして、その混合流体が主流体として、前記主流路接続部材 60 の接続流路 63 の主流路接続口 64 から流出する。これに対して、前記弁駆動機構 40 の電磁誘導により各弁ブロック体 20A, 20B, 20C の各弁体 30 の何れかが前進 (ここでは下降) すると、該弁体 30 に対応する分岐流路 28 が閉じられ、それに対応する流体の貫通主流路 27 への供給が停止する。

【0027】続いて、所定流体を複数の場所へ分配して供給するために、当該マニホールド弁構造体10を用いる場合における作動について述べる。最初に、前記主流路接続部材60の接続流路63の主流路接続口64からマニホールド弁構造体10内に入った流体は、前記貫通主流路27を満たすと共に、その流体は各弁ブロック体20A、20B、20Cの各分岐流路28内に流入する。次いで、前記各弁ブロック体20A、20B、20Cの各弁体30が後退（ここでは上昇）し、前記分岐流路28の弁室側開口28oが開くと所定流量の流体が前記各弁室29内及び各副流路51内に流入し、その後前記各副流路51の各副流路接続口52から弁構造体10外へ流出される。一方、前記弁駆動機構40の電磁誘導により各弁ブロック体20A、20B、20Cの各弁体30の何れかが前進（ここでは下降）すると、該弁体30に対応する分岐流路28の弁室側開口28oが閉じられ、流体の弁室29への流入（供給）が停止する。

【0028】なお、本発明は、上記実施例に限定されるものではなく、発明の趣旨を逸脱しない範囲において構成の一部を適宜に変更して実施することができる。例えば、上記実施例では、3個の弁ブロック体を連結しているが、2個の弁ブロック体を連結するようにしても良いし、4個以上の弁ブロック体を連結するようにしても良い。すなわち、弁ブロック体の数を適宜選択するだけで、様々なユーザーのニーズ、つまり多種多様な副流体の数（或いは流体を分配供給する作業場所の数）に簡単に対応でき、汎用性に優れる。また、マニホールド弁構造体の設置後、前記副流体の数（或いは流体を分配供給する作業場所の数）を変更する必要が生じても、それに簡単かつ迅速にしかも低コストで対応することができる。

【0029】また、上記実施例では、貫通主流路27の一端側を主流路封止部材70により封止して使用されているが、これに限定されず、図8に示すように、複数の弁ブロック体20A、20B、20Cの両側端面（最外側に位置する端面）における連結凸部23及び連結凹部25の両方に主流路接続部材60、60を連結し、貫通主流路27の両端側を開放して、一方の主流路接続部材60の主流路接続口64を混合流体等の主流体の流出口とし、他方の主流路接続部材60の主流路接続口64を前記主流体の流入口となるように使用しても良い。すなわち、本発明のマニホールド弁構造体10は、主流路接続部材60及び主流路封止部材70を適宜利用することにより、ユーザーの望む用途に応じた使用態様の選択が可能となる。

【0030】

【発明の効果】以上図示し説明したように、本発明に係るマニホールド弁構造体においては、貫通主流路、分岐流路、弁室、弁体、弁駆動機構、副流路等をそれぞれ有する各弁ブロック体は互いに独立して構成されているの

で、該弁ブロック体を適宜数組み合わせることにより、ユーザーの多種多様なニーズ、つまり弁構造体内部に供給する流体（副流体）の数（或いは流体を分配供給する場所の数）に合致するマニホールド弁構造体を容易に提供でき、極めて汎用性に優れる。また、当該マニホールド弁構造体は、その設置後に内部に供給する流体の数（或いは流体を分配供給する場所の数）を変更する必要が生じても、それに簡単かつ迅速にしかも低コストで対応することができる。

【0031】また、外部との接続部となる主流路接続部材及び主流路の一端側を封止する主流路封止部材は、各弁ブロック体同士を連結するために各弁ブロック体に設けられた連結凸部又は連結凹部と連結可能となっており、複数個連結された弁ブロック体の端部における連結に利用されない連結凹部又は連結凸部に前記主流路接続部材又は主流路封止部材が連結されるように構成されている。そのため、連結する各弁ブロック体を互いに同一の構造とすることができ、すなわち一種類の弁ブロック体で済み、コスト及び設計上極めて有利である。さらに、当該マニホールド弁構造体にあつては、前記主流路接続部材及び主流路封止部材は端部側固定部材を介してベース部材にそれぞれ固定されているため、該主流路接続部材及び主流路封止部材が弁ブロック体から抜けたり外れたりするのを防ぐことができる。

【図面の簡単な説明】

【図1】この発明の一実施例に係るマニホールド弁構造体の一部切り欠き断面を有する正面図である。

【図2】図1の2矢視図である。

【図3】図1の3-3断面図である。

【図4】図1の4-4断面図である。

【図5】同マニホールド弁構造体における各弁ブロック体の連結前の状態を簡略に示す部分斜視図である。

【図6】同マニホールド弁構造体の主流路接続部材及び端部側接続部材用固定部材等を示す部分斜視図である。

【図7】同マニホールド弁構造体の主流路封止部材及び端部側封止部材用固定部材等を示す部分斜視図である。

【図8】同マニホールド弁構造体の主流路封止部材を用いない使用状態を示す正面図である。

【図9】従来のマニホールド弁構造体の一部切り欠き断面を有する正面図である。

【図10】図9のZ-Z断面図である。

【符号の説明】

10：マニホールド弁構造体

11：ベース部材

20A、20B、20C（20）：弁ブロック体

21：取付用固定部

22：バルブボディ本体

23：連結凸部

24：凸部側連結開口

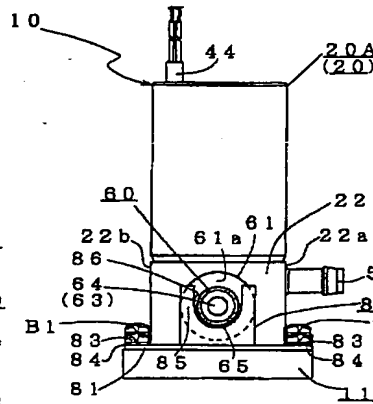
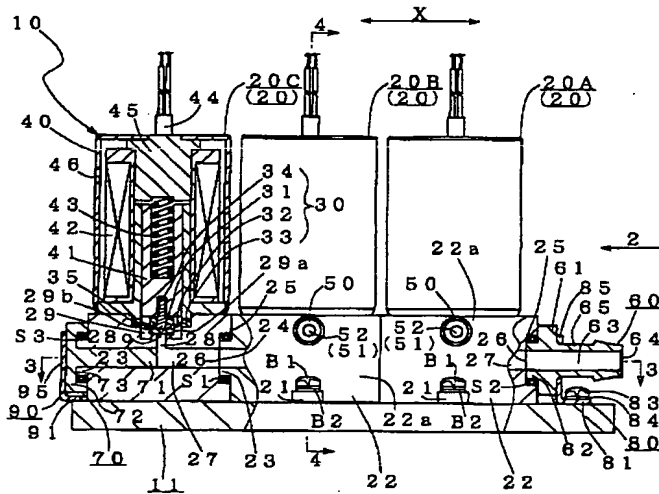
25：連結凹部

26 : 凹部側連結開口
27 : 貫通主流路
28 : 分歧流路
29 : 弁室
30 : 弁体
40 : 弁駆動機構
50 : 副流路

51 : 副流路接続口
60 : 主流路接続部材
61 : 接続流路
70 : 主流路封止部材
80, 90 : 端部側固定部材
81, 91 : 取付部

【図1】

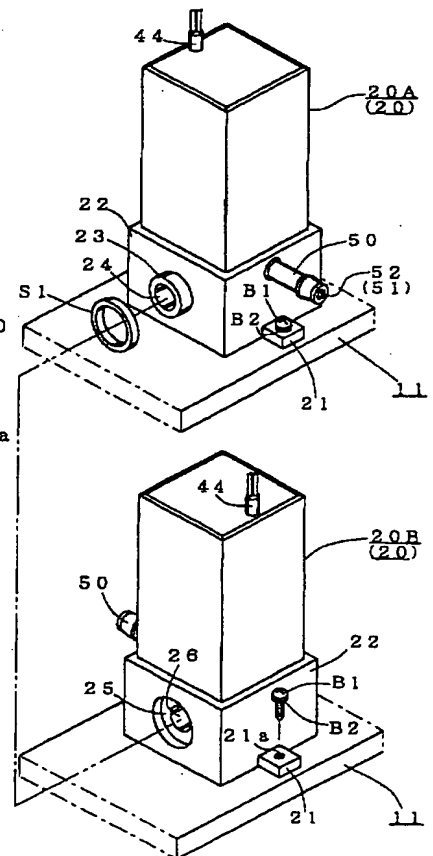
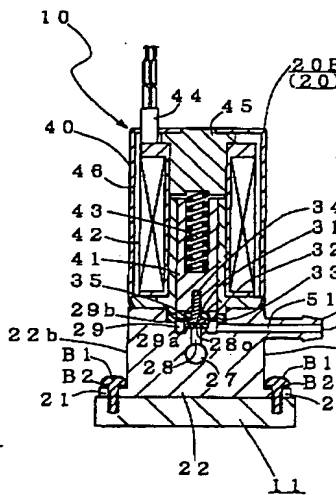
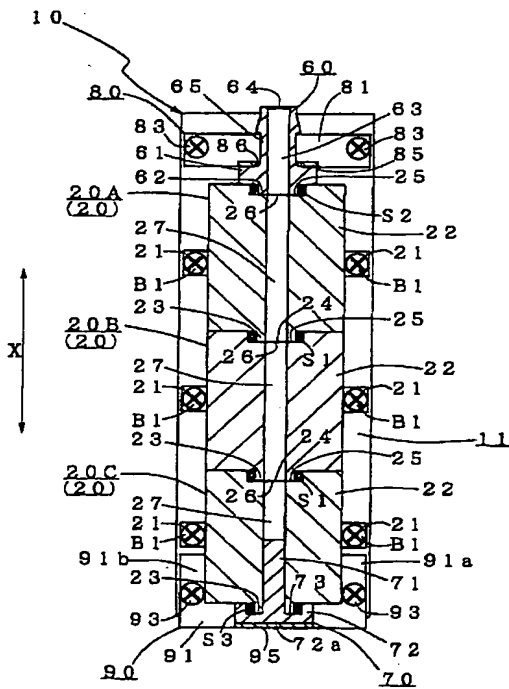
【図2】



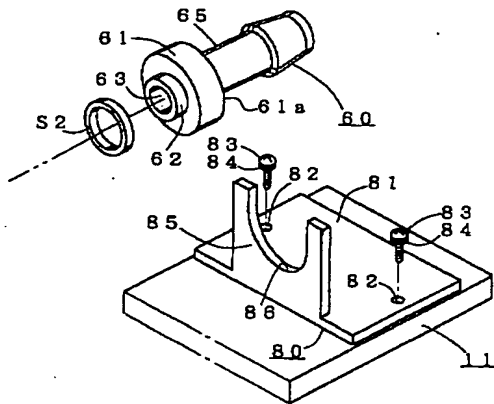
【図5】

【図3】

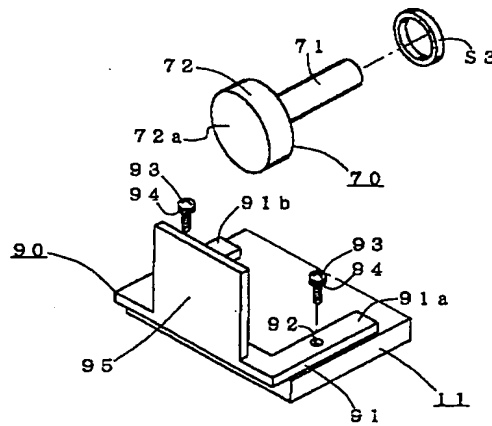
【図4】



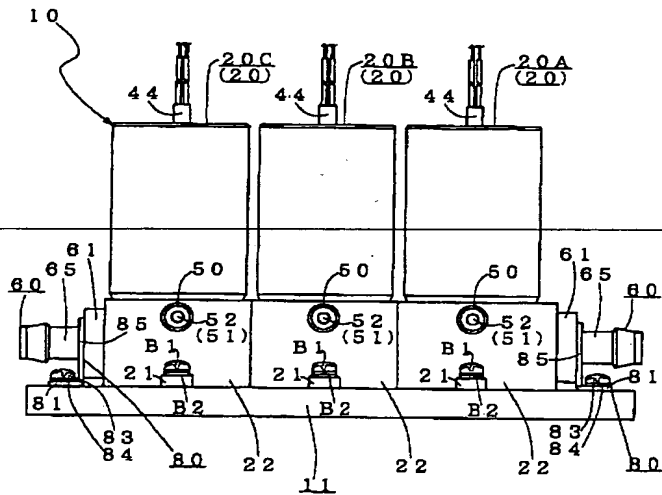
【図6】



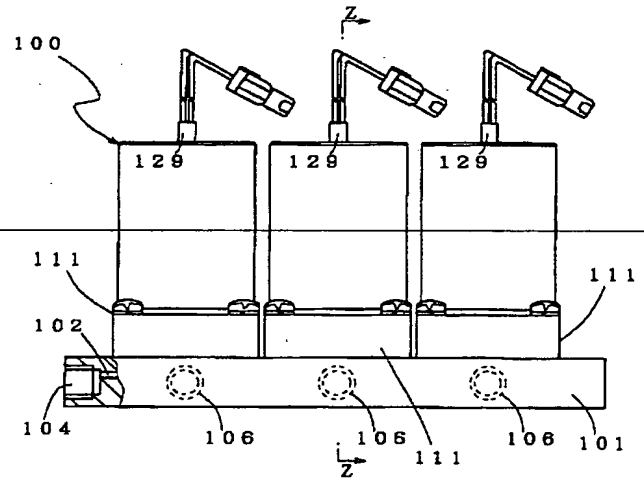
【図7】



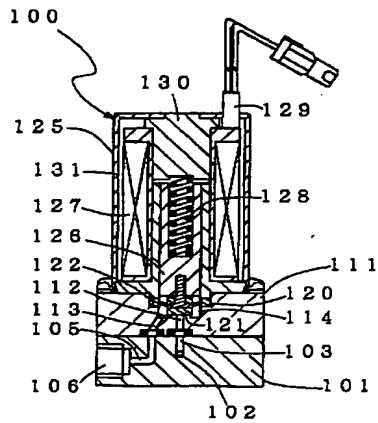
【図8】



【図9】



【図10】



フロントページの続き

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